
CHAPTER: Sensitivity to Market Risk

SECTION: Derivative Instruments and Hedging

Section 660

INTRODUCTION

The market for derivatives has grown rapidly during the past decade. For the most part, this rapid growth reflects the broad range of applications for these derivative products and their wide acceptance by financial institutions, institutional investors, and corporate treasurers. Savings associations typically use derivatives for hedging purposes. In this Handbook Section, we discuss specific objectives and considerations associated with hedging activity. Also in this Section, we describe the characteristics and risks of derivatives, and several regulatory considerations surrounding their use in hedging interest rate risk.

DERIVATIVE INSTRUMENTS

Financial derivatives are contracts that derive their value from that of an underlying asset, index, or reference rate. The most commonly used financial derivatives are swaps, futures, forwards, and options.

Some also use the term derivative security to describe securities with option-like characteristics and securities created by tranching, or stripping, other financial instruments. Derivative securities include structured notes and collateralized mortgage obligations (CMOs). A discussion of CMOs appears in Handbook Section 540, Investment Securities, Appendix C; and Handbook Section 560, Deposits and Borrowed Funds.

There are two distinct groups of derivative instruments: forward-based products and option-based products. Forward-based products include futures, forward contracts, and swaps. Option-based products include puts, calls, caps, floors, and collars. Some derivatives, such as options on futures, optional-purchase mortgage commitments, swaptions, and forward caps, combine the features of both forward and option contracts. Some derivatives trade on organized exchanges, while others trade on over-the-counter (OTC) markets.

Standardized contracts traded on the futures and options exchanges are exchange-traded derivatives. Each exchange operates a corporation, known as a clearinghouse, where it reconciles, guarantees, and settles all contracts. The clearinghouse places itself between the buyer and seller of each contract, and serves as the counterparty to each contract.

OTC contracts, on the other hand, are agreements entered into through private negotiations. Parties seek each other out to negotiate a trade. Many large securities firms and commercial banks, known as derivatives dealers, deal or make markets in derivatives. Swaps, forward agreements, options, caps, and floors actively trade in the OTC market. We discuss the different types of derivative instruments later in this Handbook Section.

Risks of Using Derivatives

Derivative instruments provide benefits but, as with other types of financial products, their use entails certain risks. The specific risks of a particular derivative transaction depend on the terms of the transaction and the financial condition and circumstances of the parties involved in the transaction. The primary risks include market risk, credit risk, legal risk, and operational risk.

Market Risk

Market risk involves the potential loss in value of a derivative due to changes in market conditions. These changes can include movements in interest rates (interest rate risk), changes in supply and demand factors (liquidity risk), and changes in other factors that can affect price. Sources of market risk differ for various types of derivatives. Savings associations should understand the forces that cause the market prices of derivatives to change.

Higher asset values or lower funding costs offset market losses on derivatives that savings associations use as hedges. In practice, however,

offsetting gains may not occur due to nonparallel movements in the yield curve, mortgage prepayments, deposit attrition, timing differences, or lack of liquidity. We discuss various types of market risk below.

Correlation Risk

The balance sheet item and the corresponding derivative may have different interest rate indices. There may not be perfect correlation between the movements of the interest indices or their correlation may change over time. For example, if a savings association uses a LIBOR-based swap to hedge short-term certificates of deposit (CDs),

the effectiveness of the hedge will depend on the extent the CD rate moves with LIBOR. If other factors, such as local market conditions, play a major role in setting rates, the hedge may be ineffective or, conversely, lower funding costs may not offset losses on the derivative. A similar correlation problem emerges when the balance sheet item and the corresponding derivatives use indices of different maturities. In that case, an inversion, or other nonparallel shift, in the yield curve could make the hedge ineffective.

Prepayment Risk

Because mortgages contain prepayment options, we do not know their actual effective maturity in advance. Moreover, prepayment rates tend to change as interest rates change. A derivative may be an effective hedge for small changes in interest rates but become invalid if interest rates move sharply up or down. Gains on a mortgage portfolio may, therefore, not fully offset losses on derivatives, and vice versa.

Deposit Attrition

Determining the effective term and rate sensitivity of non-maturity deposits, such as MMDAs and passbook accounts, is difficult because these deposits do not have explicit maturities. Withdrawal rates and the extent their interest rates track market rates vary over time and across institutions. As a result, hedging these liabilities is imprecise and requires a thorough analysis of depositor behavior.

Timing Differences

Another source of risk arises from timing differences between the hedging instrument and the hedged item. Consider the case of using swaps to hedge retail CDs. Swaps reprice on a specific date (for example, the end of a quarter) but CDs mature or reprice throughout a quarter. If interest rates change considerably within a quarter, the swap could be an ineffective hedge. A savings association can diversify this timing risk by entering into a number of separate swaps with different reset dates.

Inaccurate Initial Pricing

Certain complex derivative instruments may be difficult to price accurately. As a result, the savings association could initiate a swap with a negative market value or overpay for an option. Savings associations should be able to ascertain that the price and rate on a derivative instrument is consistent with current market conditions.

Illiquidity

Derivative use involves two types of liquidity risks. The derivative instrument may be illiquid, making the position difficult or expensive to unwind. Potential illiquidity is greatest with exotic derivatives.

Credit Risk

Credit risk is the potential for loss due to counterparty default. The evaluation of credit risk is particularly important in the case of OTC derivatives because the creditworthiness of counterparties can vary significantly. By comparison, the market views counterparty risk on exchange-traded contracts as minimal because the exchanges guarantee the performance of each contract. In addition, credit exposures on exchange-traded options are small because of the margin requirements and daily settlement practices imposed by the exchanges.

The credit risk of derivatives consists of two distinct elements: current exposure and potential exposure. Current exposure is the market value of

the derivative at any point in time. The market value of a derivative equals the net present value of the derivative's future cash flows and represents the cost of replacing the contract with a new one if the counterparty defaults.

The current exposure can be either positive or negative. When the current exposure is positive, the contract represents an asset and the holder of the contract will suffer a loss if the counterparty defaults. When the market value of the contract is negative, the contract represents a liability. Therefore, no credit loss occurs if there is a default since the contract has no value. The current exposure on exchange-traded contracts is negligible since exchanges require daily settlement of gains and losses on contracts.

The calculation of potential exposure incorporates possible changes in the market value of the contract as market conditions change. Market participants use various techniques, such as Monte Carlo simulation and option pricing models, to estimate potential exposures. For a credit loss to occur on a swap, two conditions must exist: the market value of the contract must be positive and the counterparty must default on the contract.

Only one side of an option contract confronts credit exposure. The writer (seller) of the option receives its fees up front, so only the buyer of the option faces a loss in the case of default. If the seller of the option defaults, the option buyer stands to lose the economic benefits associated with the option as well as an accounting loss equal to the unamortized option premium.

Savings associations must restrict their choice of counterparties to banks and well-capitalized non-bank entities. The market often uses collateral arrangements in derivative transactions to reduce exposure to counterparty risk. In swap transactions, collateral arrangements are subject to negotiation and can be either unilateral or bilateral. Under a unilateral arrangement, only the less creditworthy counterparty must post collateral. Under a bilateral arrangement, neither side posts collateral initially, but either side may need to post collateral later if a triggering event occurs. Triggering events include credit down gradings or sharp movements in interest rates.

When a party has two or more swap transactions involving the same counterparty, it uses a netting arrangement to reduce risk. Typical netting arrangements call for counterparties to net all transactions in the event of default. This means that all contracts between the two parties are marked-to-market, and those with negative values provide an offset against those with positive values.

Without netting arrangements, no offset occurs in the event of default. As a result, a practice known as cherry picking may occur. For example, a firm may have two swaps with the same counterparty—one with a positive replacement value and one with a negative replacement value. If the firm confronts bankruptcy, it may attempt to seek relief from the swap that has a negative replacement value (a liability) and attempt to force the counterparty to continue to pay on the swap with a positive value.

Legal Risk

Legal risk with OTC derivatives results from the fact that provisions may be unenforceable for the following reasons:

- Inadequate documentation.
- Illegality of the contract.
- Ineligibility of a counterparty to enter the transaction.
- Bankruptcy or insolvency of the counterparty.

Operational Risk

Operational risk is the potential for loss from a failure of internal systems and controls, human error, or fraud. Operational risk can arise from lack of management expertise and depth, excessive reliance on third parties, lack of involvement by senior management and the board of directors, and lack of checks and balances in derivative transactions.

HEDGING

Savings associations can reduce financial risk by hedging. Hedging can involve forward commitments, futures, options, and swaps.

Before engaging in any hedging strategy, management must review the savings association's overall interest rate risk position under various interest rate scenarios as required by Thrift Bulletin 13a. This evaluation would also include the effect of any hedge strategies.

Macro-hedging and Micro-hedging

The objective of a macro-hedge is to reduce the interest rate risk of a savings association based on a complete analysis of the balance sheet and off-balance sheet items. The objective of a micro-hedge is to reduce or eliminate the risk of a specific balance sheet or off-balance sheet item. Section 563.172 generally requires that the hedge positions reduce the interest rate risk of the institution.

You should not evaluate the appropriateness of a micro-hedge in isolation, but rather in the context of its effect on the overall interest rate risk of the savings association. Sometimes a micro-hedge can increase rather than reduce a savings association's overall interest rate risk. For example, a savings association that is liability sensitive can establish a micro-hedge to offset the interest rate risk of a fixed-rate mortgage-servicing portfolio. This portfolio may provide protection against an increase in interest rates, as the value of the portfolio would increase as interest rates increase and mortgage prepayments slow.

A well-constructed hedge (one developed with the benefit of an analysis of the overall interest rate risk) should meet the requirements of Statement of Financial Accounting Standard (SFAS) 133, Accounting for Derivative Instruments and Hedging Activities.

In June 1998, the Financial Accounting Standards Board (FASB) issued SFAS 133 as amended by SFAS 137, Accounting for Derivative Instruments and Hedging Activities — Deferral of the Effective Date of FASB Statement No. 133 (issued

June 1999); and SFAS 138, Accounting for Certain Derivative Instruments and Certain Hedging Activities (issued June 2000). SFAS 137 became effective with fiscal years ending after June 15, 2000.

Management, in coordination with an independent audit firm, should establish a policy containing standards, parameters, and conditions to assess the required level of correlation and hedge effectiveness. SFAS 133 requires that a gain or loss from the item hedged be highly correlated to the gain or loss from the hedging instrument. SFAS 133 does not define high correlation. However, in practice, the gain or loss from the future contracts should equal no less than 80 percent to 120 percent of the change in value from the hedged instrument. SFAS 133 limits hedge accounting to those relationships in which derivative instruments and certain foreign currency-denominated nonderivative instruments are designated as hedging instruments and the necessary qualifying criteria are met.

Derivatives subject to SFAS 133 include, but are not limited to, interest rate swaps, options, futures, and forwards. In developing this complex proposal, the FASB concluded that the following five fundamental decisions should serve as cornerstones:

- Derivatives are assets or liabilities, and should be reported in the financial statements. (Prior to SFAS 133, most derivatives, except those held for trading, were "off-balance sheet" and, savings associations did not report them in the financial statements.)
- Fair value is the most relevant measure for financial instruments, and the only relevant measure for derivatives.
- Savings associations should measure derivatives at fair value, and adjustments to the carrying amount of hedged items should reflect changes in their fair value (that is, gains and losses) that are attributable to the risk being hedged and that arise while the hedge is in effect.
- Savings associations should report only items that are assets or liabilities in the financial

statements. (Savings associations should not defer and treat realized gains and losses on certain derivatives used for hedging as an asset or liability.)

- Savings associations should use special accounting for items designated as being hedged only for qualifying transactions; one aspect of qualification should be an assessment of offsetting changes in fair values or cash flows.

Accounting Treatment

Savings associations must account for and disclose hedging transactions and derivative instruments according to generally accepted accounting principles (GAAP). SFAS 133 is a significant accounting change that requires an institution to record all derivatives on the balance sheet as assets or liabilities at their fair value. Under SFAS 133, savings associations should report changes in the fair value of most derivatives in net income. However, savings associations should record the accumulated gains (losses) for derivatives that qualify as effective cash flow hedges, in other comprehensive income, a component of GAAP equity capital. SFAS No. 133 also requires certain disclosures.

Management should consult with its independent auditor to ensure compliance with GAAP. Where GAAP does not specifically address the accounting treatment for a particular derivative instrument, the savings association should document the accounting treatment they use and record the basis for the adopted treatment.

Evolving accounting and regulatory requirements makes it necessary to keep abreast of legislative, regulatory, and accounting initiatives that could affect the treatment of certain derivatives and influence their market values. On December 29, 1998, the FFIEC issued interim regulatory reporting and capital guidance that departs from GAAP. That guidance requires an institution that has adopted SFAS 133 to report derivative instruments as follows:

- Do not include accumulated gain (losses) for effective cash flow hedges in regulatory capital.
- Report accumulated gain (losses) for ineffective cash flow hedges and for all fair value hedges in net income. This affects the numerator for both the Tier 1 and risk-based capital calculations.
- Separately record and independently risk-weight embedded derivatives and the associated financial instrument.

Management should regularly perform worst-case scenario analysis that measures the potential effect on the savings association of changes in regulatory or accounting rules.

OTS POLICY ON DERIVATIVES

The Office of Thrift Supervision's rule on financial derivatives in § 563.172 permits savings associations to engage in transactions involving financial derivatives. The rule also describes the responsibilities of a savings association's board of directors and management regarding financial derivatives. In addition, Thrift Bulletin 13a (TB 13a) provides guidance on the use of financial derivatives.

Sensitivity Analysis or Stress Testing

Management should exercise diligence in assessing the risks and returns (including expected total return) associated with investment securities and financial derivatives. As a matter of sound practice, before taking an investment position or initiating a derivatives transaction, a savings association should:

- Ensure that the proposed transaction is legally permissible for a savings association.
- Review the terms of and condition of the financial derivatives.
- Ensure that the proposed transaction is allowable under the savings association's derivatives policies.

- Ensure that the proposed transaction is consistent with the savings association's portfolio objectives and liquidity needs.
- Exercise diligence in assessing the market value, liquidity, and credit risk of the financial derivatives.
- Conduct a pre-purchase portfolio sensitivity analysis for any significant transaction involving financial derivatives (as described below in Significant Transactions).
- Conduct a pre-purchase price sensitivity analysis of any financial derivative before taking a position.¹

Significant Transactions

A significant transaction is any transaction (including one involving financial instruments other than complex securities) that is expected to increase a savings association's Sensitivity Measure by more than 25 basis points. Before undertaking any significant transaction, management should conduct an analysis of the incremental effect of the proposed transaction on the interest rate risk profile of the institution. The analysis should show the expected change in the savings association's net portfolio value (with and without the proposed transaction) that would result from an immediate parallel shift in the yield curve of plus and minus 100, 200, and 300 basis points. In general, a savings association should conduct its own analysis. It may, however, rely on analysis conducted by an independent third-party (that is, someone other than the seller or counterparty) provided management understands the analysis and its key assumptions.

Savings associations with less than \$1 billion in assets that do not have an internal modeling capability to conduct such an incremental analysis may

¹ The following financial derivatives are exempt from pre-purchase analysis: commitments to originate, purchase, or sell mortgages. To perform the pre-purchase analysis for derivatives whose initial value is zero (for instance, futures, swaps), the savings association should calculate the change in value as a percentage of the notional principal amount.

use the most recent quarterly NPV estimates for their institution provided by OTS. The association can use these NPV estimates to estimate the incremental effect of a proposed transaction on the sensitivity of its net portfolio value.²

Complex Securities and Financial Derivatives

Before taking a position in a complex security or financial derivative, a savings association should conduct a price sensitivity analysis (that is, a pre-purchase analysis) of the instrument. At a minimum, the analysis should show the expected change in the value of the instrument that would result from an immediate parallel shift in the yield curve of plus and minus 100, 200, and 300 basis points. Where appropriate, the analysis should encompass a wider range of scenarios (for example, nonparallel changes in the yield curve, changes in interest rate volatility, changes in credit spreads, and in the case of mortgage-related securities, changes in prepayment speeds). In general, a savings association should conduct its own in-house pre-acquisition analysis. A savings association may, however, rely on an analysis conducted by an independent third-party provided management understands the analysis and its key assumptions.

Risk Reduction

In general, the use of financial derivatives with high-price sensitivity³ is limited to transactions and strategies that lower a savings association's interest rate risk as measured by the sensitivity of net portfolio value to changes in interest rates. A savings association that uses financial derivatives

² Savings associations that are exempt from filing Schedule CMR and that choose not to file voluntarily should ensure that no transaction – whether involving complex securities, financial derivatives, or any other financial instruments – causes the institution to fall out of compliance with its board of directors' interest rate risk limits.

³ For purposes of TB 13a, complex securities with high price sensitivity include those whose price would be expected to decline by more than 10 percent under an adverse parallel change in interest rates of 200 basis points.

for a purpose other than reducing portfolio risk should do so according to safe and sound practices and should:

- Obtain written authorization from its board of directors to use such instruments for a purpose other than to reduce risk.
- Ensure that, after the proposed transaction(s), the savings association's post-shock NPV Ratio would not be less than four percent.

The use of financial derivatives or complex securities with high price sensitivity for purposes other than to reduce risk by savings associations that do not meet the conditions above, constitutes an unsafe and unsound practice.

Recordkeeping

Savings associations must maintain accurate and complete records of all derivatives transactions according to 12 CFR § 562.1. Savings associations should retain any analyses (including pre- and post-purchase analyses) relating to investments and derivatives transactions and make such analyses available to examiners upon request.

In addition, for each type of financial derivative instrument the board of directors authorizes, the savings association should maintain records containing the following information:

- The names, duties, responsibilities, and limits of authority (including position limits) of employees authorized to engage in transactions involving the instrument.
- A list of approved counterparties with which transactions may be conducted.
- A list showing the credit risk limit for each approved counterparty.
- A contract register containing key information on all outstanding contracts and positions.

The contract registers should specify the following information:

- Type of contract

- Price of each open contract
- Dollar amount
- Trade and maturity dates
- Date and manner in which contracts were offset
- Total outstanding positions.

Where deferred gains or losses on derivatives from hedging activities are consistent with generally accepted accounting principles (GAAP), the savings association should maintain appropriate supporting documentation.

GUIDELINES FOR THE BOARD OF DIRECTORS AND MANAGEMENT

A savings association's board of directors must manage interest rate risk prudently (12 CFR § 563.176). Under Part 570 Appendix A II, Operational and Management Standards, savings associations must have prudent policies, practices, and systems. These requirements include management of interest rate risk, assessment of asset quality, maintenance of internal controls and information systems and appropriate internal audit systems. Savings associations also must maintain and make available to you an accurate and complete record of transactions involving derivative products (12 CFR Part 562).

Derivatives Guidelines

Savings associations that use derivatives should adhere to the following guidelines.

Board of Directors' Approval

The board of directors should adopt and enforce a written policy authorizing and governing the use of derivative products. The policy should (1) identify authorized derivative products and (2) mandate record-keeping systems detailed enough to permit internal auditors to determine whether personnel have operated according to the board's authorization.

Management should report periodically to the board regarding compliance with the board's policies on the use of derivative products.

Interest Rate Risk Policy

Savings associations must have a comprehensive policy detailing their overall interest rate risk management and investment strategy, pursuant to 12 CFR § 563.176. That plan should include a description of the savings association's derivative strategy and objectives.

Internal Controls

A savings association should establish the following internal controls and procedures:

- Periodic reports to management.
- Segregation of duties.
- Adherence to internal policies and procedures.
- Prevention of unauthorized transactions and other abuses.

Segregation of Duties

Internal systems and procedures should segregate duties between those responsible for execution, record keeping, and verification. Management should designate those authorized to transact derivatives.

Position Limits

Management should establish specific position limits (expressed as dollar amounts, or as a percentage of assets or capital) for each major type of derivative product and for each counterparty. Savings associations can measure position limits in terms of either notional balances or value at risk (VAR). The VAR approach provides a more comprehensive indicator of credit and market risk because it considers the current market value and volatility of a derivative contract as well as its size. A ten-year swap has more credit risk and market risk than a two-year swap of the same notional balance because a given change in market interest rates has a greater effect on market value.

The limits should be consistent with the following characteristics:

- The savings association's intent.
- Level of management expertise.
- Sophistication of internal control and monitoring systems.
- Asset/liability structure.
- Capacity to maintain liquidity and absorb losses out of capital.

The board of directors, an authorized committee thereof, or the savings association's internal auditors should monitor conformance with such limits. Internal auditors should report their reviews to the board of directors or a committee of the board on a regular basis.

Aggregating Credit Exposures

Savings associations should aggregate credit exposures to a counterparty considering enforceable netting arrangements. The savings association should regularly calculate credit exposures and compare them to credit limits.

Marking-to-Market

Savings associations should mark their derivatives positions to market on a regular basis for risk management purposes.

Professional Expertise

Savings associations must ensure that they have adequate staff to undertake their derivatives activities. The staff must have the appropriate experience, skill levels, and degrees of specialization.

Savings associations should not place undue reliance on, or delegate decision-making authority to third-party investment advisors. Savings associations must document decisions they make on the recommendations of third parties. (The use of investment advisors should be according to the guidance provided in Handbook Section 540, Investment Securities.)

Counterparty Credit Analysis

Savings associations should control counterparty credit risk by limiting transactions to financially strong counterparties. Savings associations should conduct a credit analysis of the counterparty before entering into a transaction. In addition, associations should investigate the dealer's general reputation for fair and honest dealings with customers. Savings associations should also conduct an inquiry of appropriate state or federal securities regulators and securities industry self-regulatory organizations concerning any formal enforcement actions against the dealer, its affiliates, or associated personnel.

Savings associations that use derivatives should assess both the benefits and costs of credit enhancement and related risk-reduction arrangements. If credit downgrades would trigger early termination or collateral requirements, an association should carefully consider its own capacity and that of its counterparties to meet the substantial funding needs that might result.

Legal Review

Management should ascertain the rights and obligations of all parties to derivative transactions by carefully reviewing all related contractual and account documents, including margin and collateral requirements, and recourse arrangements. Management should thoroughly understand those rights and obligations to avoid possible misunderstandings.

Master Agreements

Savings associations that use derivatives should use one master agreement with each counterparty to document existing and future derivatives transactions, including options. Master agreements should provide for payments netting and closeout netting, using a full two-way payments approach.

Evaluation of Hedging Transactions

For hedging transactions, internal reports should show the market value of the derivative instruments and reconcile the gains and losses to the changes in the value of hedged balance sheet

items. For example, if a savings association bought futures contracts to hedge the market value of a group of assets, the savings association should compare the performance of the futures contracts with the performance of the hedged assets to evaluate the overall performance of a hedging program. The savings association should perform an assessment of hedging effectiveness at least quarterly. Monthly assessment may be necessary for larger hedging transactions.

TFR Reporting

Savings associations report derivatives positions on Schedule CMR (Consolidated Maturity and Rate) of the Thrift Financial Report. In addition, savings associations indicate whether they have any outstanding futures and options positions on Schedule SQ (Consolidated Supplemental Questions).

Hedging Guidelines

There are numerous ways to hedge. Management must select the optimal method for hedging based on the institution's level of risk and the level of in-house expertise. Management must assess the potential costs and benefits of a hedge strategy before its implementation. The savings association must analyze the yield and price characteristics of the hedging instrument(s) and compare these characteristics to those of the hedged assets, liabilities, or off-balance sheet positions. Management should evaluate and document the pre-hedging analysis with various examples of the intended strategies and how these strategies would perform under varying interest rate scenarios.

The board of directors and management must consider the level of expertise needed to implement a hedge strategy. If using outside consultants, the savings association must have in-house personnel who thoroughly understand the consultants' recommendations. Management must maintain the final decision-making authority, but they can use the information provided by consultants and brokers. Following the advice of an outside consultant without a thorough understanding of the strategy is not an acceptable practice. Management should not rely solely on the advice of a broker to determine hedge ratios or when to estab-

lish or offset hedge positions. Since the broker's commissions depend on transaction volume, there may be an inherent conflict.

One of the keys to a successful hedging program is the expertise of management. Management must have adequate knowledge of various hedging instruments, a thorough understanding of asset/liability management techniques, and the savings association's current interest rate risk position under different interest rate scenarios. Management must also be able to explain the strategies and the methods used to evaluate the effectiveness of the hedging program without relying on assistance from outside consultants or brokers.

Policies, Procedures, and Recordkeeping Requirements

Savings associations that engage in hedging transactions must have specific written policies and internal control procedures regarding these activities. Policy objectives must be specific enough to outline permissible strategies and take into account:

- The price and yield correlations between assets or liabilities and the hedging instruments with which they are matched (that is, the hedge ratio).
- The relationship of the strategies to the institution's operations.
- How the strategies reduce interest rate risk.

If the hedging program involves complex strategies, documentation should include examples of the intended strategies. The hedging policy should reflect changes in hedging strategies.

The written policy should establish position limits and the parameters by which the board of directors and management will monitor the effectiveness of the hedging program. The board should authorize the individual(s) responsible for executing hedging transactions and establish limits of authority for the individual(s). The board should also approve the selection of consultants and brokers and set specific limitations on the

level of authority granted. Policies and procedures should include the segregation of duties between the execution of hedge positions and the transfer of funds. Monthly monitoring reports should detail the volume of transactions, all outstanding positions, the unrealized gains or losses on these positions, and the realized gains or losses from closed positions.

Savings associations must document and monitor all facets of hedging programs, and maintain contract registers for all financial derivatives. The contract registers should specify the type of contract, the price of each open contract, the dollar amount, the trade and maturity dates, the date and manner in which contracts offset each other, the offset gain or loss, and the total outstanding positions. Savings associations must maintain a schedule of the hedged assets and/or liabilities and document the method used to determine the dollar amount of the hedging instrument. The savings association must also maintain documentation on the following:

- Deferred gains or losses from hedge positions.
- Correlation between the gain or loss from the hedging instrument.
- Change in value of the item hedged during the hedge period.
- Method used to amortize any deferred gains or losses from hedge positions.

TYPES OF DERIVATIVE INSTRUMENTS

Swaps

Interest Rate Swaps

Interest rate swaps are the most common type of financial derivative used by savings associations. An interest rate swap is an agreement between two parties to exchange a series of cash flows (based on notional principal amounts) at specified intervals known as payment or settlement dates. The parties do not exchange actual principal amounts. Instead, the parties usually net interim payments, with the net amount being paid to one party or the other.

Savings associations use interest rate swaps primarily to manage interest rate exposure and to reduce debt-financing costs. Swaps transform an existing cash flow stream into a more desirable one from the point of view of a financial institution. For example, a savings association can use a swap to transform floating-rate liabilities into fixed-rate liabilities. Because the parties negotiate swap contracts, they can swap virtually any kind of payment stream. The most common type of swap is the fixed-for-floating interest rate swap.

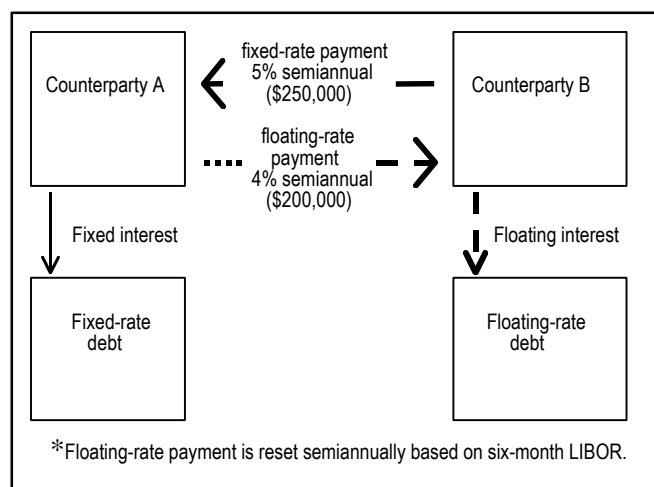
With a fixed-for-floating interest rate swap, one party exchanges a fixed-rate interest payment stream for a floating-rate payment stream. The party that agrees to make fixed-rate payments is the fixed-rate payer, and the party that makes the floating-rate payments is the floating-rate payer. In this instance, a fixed-for-floating swap enables the fixed-rate payer to transform floating-rate liabilities into fixed-rate liabilities. A party could also transform fixed-rate assets into floating-rate assets.

Figure 1 shows an example of a fixed-for-floating interest rate swap. In this example, Counterparty A has \$10 million of fixed-rate borrowings that it wants to convert into floating-rate borrowings. Counterparty B has \$10 million of floating-rate borrowings that it wants to convert into fixed-rate borrowings. Both parties agree to enter into an interest rate swap with a notional amount of \$10 million. The agreement requires Counterparty B to make semiannual payments to Counterparty A at a fixed rate of five percent for three years. In exchange, Counterparty A agrees to make floating-rate payments based on the six-month London Interbank Offered Rate (LIBOR) with an initial rate of four percent.

In the example, B (the fixed-rate payer) will make a net payment of \$50,000 to A (the floating-rate payer) on the first semiannual payment date. On that date, the floating rate for the next six months resets based on the prevailing six-month LIBOR. If six-month LIBOR increases after the swap is initiated, A's cost of funds will rise because it is obligated to make floating-rate payments to B. On the other hand, B, will benefit if rates rise, since it will receive higher floating-rate payments, while its payments remain fixed at five percent of the

notional amount. Savings associations exposed to rising rates (for example, the typical savings association holding interest-bearing deposits) can reduce their exposure by entering into fixed-for-floating swaps as the fixed-rate payer.

Figure 1
Fixed-for-Floating Interest Rate Swap



Basis Swaps

Basis swaps involve the exchange of payments based on two different floating-rate indices, such as one-month LIBOR against the Eleventh District Cost of Funds Index (COFI). For example, a pay-COFI, receive-LIBOR swap effectively converts a COFI ARM into a LIBOR ARM, allowing the savings association to match LIBOR-indexed borrowings more closely. The market also calls basis swaps floating-for-floating swaps.

Swap Termination

A savings association may wish to reverse or terminate (unwind) a swap before maturity. There are two ways to unwind a swap position. One way is to negotiate a termination settlement with the original counterparty. The other is to enter into a new swap that is a mirror image of the existing swap to offset the existing position.

Swap Variations

Most swaps have a specified maturity date and a fixed notional amount. Some swaps, however, have notional amounts that amortize over time. Swaps can also be callable, where one of the counterparties has an option to terminate the swap if interest rates increase or decrease beyond the strike rate. A forward swap is a firm commitment to enter into a swap at a specified future date.

Uses and Evaluation of Swaps

Swaps can synthetically extend the term of a matched liability over the term of the swap in much the same way as futures contracts are used to fix financing costs. However, swaps do not require the same active management that futures or options positions require. Swaps are not as liquid as futures contracts. A savings association can offset a swap position and, in effect, cancel it if they negotiate an offset with the counterparty or enter into a reverse swap with terms that are similar to the original swap agreement.

To evaluate the appropriateness of a swap agreement, management should monitor the correlation of the effective spread from the assets and liabilities being hedged by using a swap with a fixed-rate payable and a variable-rate receivable. For example, if a savings association enters into a five-year swap where the fixed interest rate is nine percent and the variable rate on the first payment date is seven percent, the savings associations must pay 200 basis points. However, if the savings association matches the swap, you should compare the variable rate with the rate paid on the matched short-term liability to determine how closely the variable rate received from the swap correlates. If these rates correlate well and the assets funded by the matched liability have a duration of approximately five years, the association may achieve a “locked-in” spread.

Forward Contracts

A forward contract obligates one counterparty to buy, and the other to sell, a specific underlying financial instrument at a specific price, amount, and date in the future. Contracts specifying settlement in excess of 30 days after the trade date

are forward contracts. Forward contracts exist for a multitude of underlying assets, including currencies, commodities, and mortgages. Forward contracts trade over-the-counter and counterparties customize these contracts to fit their particular objectives.

Figure 2
Profit of Forward Contract - Long Position

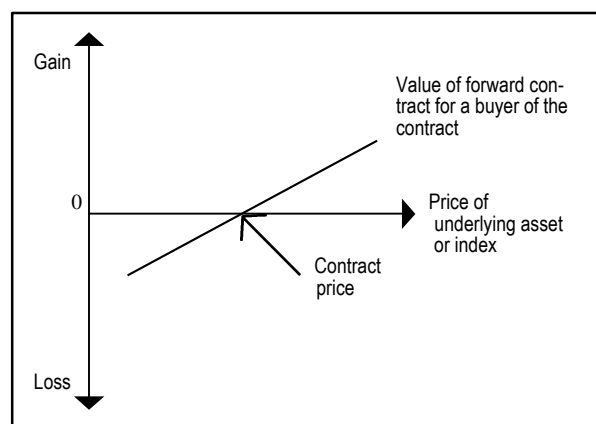


Figure 2 shows the payoff profile of a forward contract. As shown, the change in the value of a forward contract is roughly proportional to the change in the value of the underlying asset or index. The value of the contract conveys at maturity through cash settlement or delivery. If, at maturity, the price of the underlying is higher than the contract price, then the buyer makes a profit. The gain to the buyer equals the loss to the seller.

Forward contracts create two-way credit risk. The counterparty on the side of the contract that has a positive replacement value confronts the credit risk of the other party. However, the market value of a contract can change from a positive value to a negative value, and vice versa. Therefore, each party must assess the creditworthiness of its counterparty because each side may experience a potential gain or loss. The value of the forward contract conveys on the maturity date of the contract. Neither party makes payments at origination or during the life of the contract. The contract owner will either receive or make a payment at

maturity, depending on the price movement of the underlying asset or index.

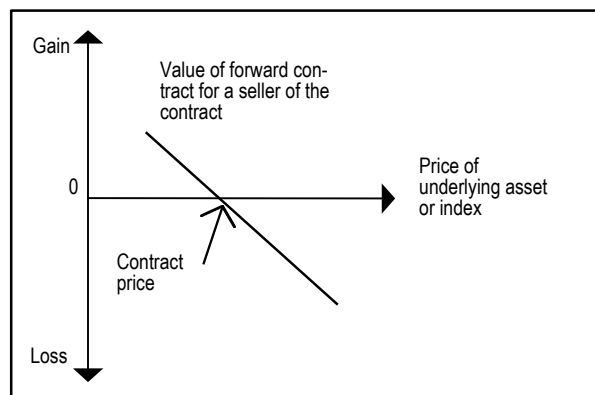
Mortgage bankers often use forward contracts to hedge the price risk of holding loans temporarily. The forward sale of mortgage loans transfers the price risk of holding mortgages in the pipeline to the counterparty. Figure 3 shows the payoff profile of a forward sale. The seller of the forward contract is short the underlying asset, and therefore gains if the value of the underlying asset declines. In a short position, the writer (seller) of a forward contract must fulfill the obligation of the contract.

Forward contracts to sell mortgage production can be either firm or optional commitments. Firm commitments require both parties to perform on the contract (delivery of mortgages or cash settlement), regardless of market conditions. In contrast, optional commitments, such as standbys, require performance only at the option of the party that purchased the option.

Savings associations typically attempt to match the terms of the forward agreement to the terms of the underlying asset that causes the risk exposure. For example, assume a savings association originates 30-year fixed-rate mortgages and expects to close most of these loans within a 45-day period. As loan production accumulates, the savings association enters into a firm forward commitment to sell 30-year loans with a settlement date 45-days in the future. For the portion of the pipeline that is uncertain as to closure, the savings association may use a standby agreement to hedge the interest rate risk.

In general, forward contracts to buy mortgages or mortgage-backed securities will increase the overall interest rate risk exposure of a typical savings association. You should examine long forward positions to determine if they are being used for speculative purposes. In a long position, the purchaser (holder) of an option contract has the right to exercise the option against the option writer.

Figure 3
Profit of Forward Contract - Short Position



Hedging with Forward Commitments

Savings associations can use firm or standby forward commitments to sell loans or securities as an economic hedging vehicle to reduce the interest rate risk of holding long-term, fixed-rate mortgages or securities in portfolio or in the loan pipeline. (Refer to the Mortgage Banking sections of the Thrift Activities Handbook.) Commitments to sell at the current market price can provide protection against the risk of declining market value associated with rising interest rates. Some savings associations enter into firm commitments to sell securities (short positions) with a dealer, but rather than deliver the securities at settlement, pair off (offset/buy back) the short positions. If interest rates rise during the commitment period, the commitments can usually be paired off at a gain.

Standby commitments to sell provide flexibility since the savings association can select the amount and cost of coverage. The maximum loss for a standby commitment to sell is the amount of the fee. The amount of the fee depends on the length of the commitment, the relationship between the market value of the underlying security and the commitment price, and the volatility of the underlying security. To determine the appropriateness of using standby commitments to sell, you should assess the cost of the option versus the amount of protection obtained.

You should review forward commitment and pair-off activity for safety and soundness. Significant losses can result from improper use of commitment contracts.

You should check for pair-off positions, where the savings association closes out forward positions before settlement with offsetting forward contracts, usually at a profit. You should review pair-offs in a held-to-maturity portfolio to determine if they constitute trading activity. While pair-offs can represent an acceptable element of a mortgage pipeline-hedging program, excessive pair-off activity may indicate an inefficient hedging process and should receive additional scrutiny. Regulators should determine whether the activity represents an economic hedging strategy or simply a speculative trading activity. To be considered a prudent economic hedging activity, the hedged items (existing or anticipated) the association must meet the following criteria:

- Identify the hedged item.
- Document the purpose of the hedge.
- Justify the hedge ratio based on historic correlation.
- Monitor and maintain the correlation throughout the hedge period.
- Evaluate and justify the effectiveness of the strategy for risk exposure.

Savings associations that use commitments (firm or standby) to hedge the loan pipeline must also document the estimate of fallout since this variable will materially affect the outcome of the hedge. Conversely, you can identify speculative trading activity by the following indicators:

- High volume of purchase and sale and/or pair-off activity.
- Positions held for only short periods.
- The lack of requisite documentation.
- Correlation analysis appropriate to a prudent economic hedging strategy.

Futures Contracts

A futures contract is a legally binding agreement to make or take delivery of a standardized quantity and quality of a commodity or financial instrument on a specified date in the future. The value of a futures contract reacts to changes in the price of the underlying commodity or financial instrument in much the same manner as the value of forward contracts. Futures contracts trade on recognized exchanges, and an exchange clearinghouse is the counterparty to each trade.

Futures contracts based on a financial instrument or a financial index are financial futures. Financial futures include interest rate futures, stock futures, and currency futures. Financial futures can be an effective means of controlling interest rate risk for savings associations. The most commonly used interest rate futures are those with Treasury bills, notes, and bonds, and Eurodollar CDs as the underlying asset.

The buyer of a futures contract takes a long position in the market and is long on the futures contract. The buyer can sell the contract at any time before settlement. In the case of an interest rate futures contract, such as a Treasury bond contract, a long position will make a profit if interest rates decline. Lower interest rates mean higher contract prices because there is an inverse relationship between interest rates and bond prices. Conversely, an increase in interest rates will produce a loss on a long position. The payoff profile of a long futures position is the same as that of a long forward contract position (see Figure 4). Note that futures contracts obligate their owners to purchase a specified asset at a specified exercise price on a specified maturity date.

The seller of a futures contract takes a short position in the market. In essence, the seller promises to deliver a commodity or financial asset even though he/she may not own the asset. A short position in a Treasury bond contract will produce a profit if Treasury bond prices decline (that is, if Treasury bond yields increase). Selling a futures contract (a short position) is an example of a hedging strategy that savings associations can use to reduce their interest rate risk exposure if the savings association will lose value when interest

rates rise. Figure 5 shows the payoff profile of a short futures position in Treasury bonds.

Figure 4
Profit of Futures Contract - Long Position

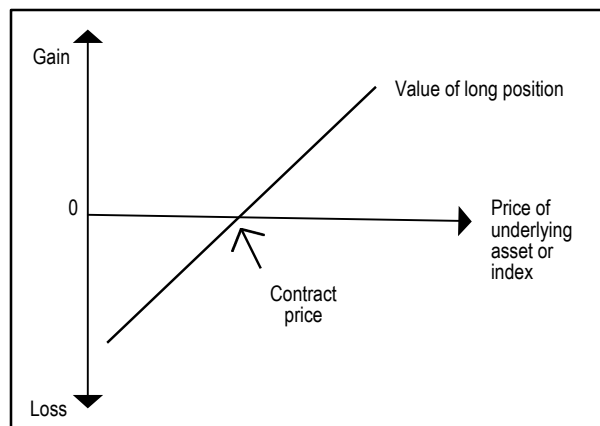
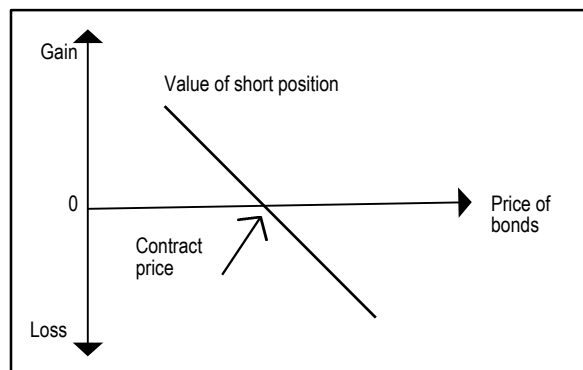


Figure 5
Profit of Treasury Bond Futures Contract - Short Position



Compared with swaps and forwards, the credit risk of futures contracts is minimal for three reasons:

- Values of futures contracts reflect daily marked-to-market changes. Any change in the value of the futures contract conveys, (that is, settled in cash) at the end of each trading day.

In contrast, the value of a forward contract conveys in a single payment at maturity. With a swap contract, changes in value convey periodically throughout the life of the swap on each settlement date.

- Buyers and sellers of futures contracts must post a performance bond, known as initial margin, with their brokers. The customer must establish an initial margin account when opening the contract. The broker adds or subtracts gains and losses on the futures contract from the margin account at the end of each day. If losses cause the margin account to fall below a specified level, the customer must post additional margin, or the broker will close out the account.
- An exchange clearinghouse is the counterparty to each futures transaction.

Hedging with Future Contracts

There are numerous hedging strategies using futures contracts. You must evaluate each strategy on a case-by-case basis. A description of some of the commonly used strategies and some of the risks of these strategies follows:

- Savings associations that attempt to hedge fixed-rate mortgages or mortgage-backed securities (MBS) with futures contracts based on either Treasury bond or Treasury note futures contracts have significant cross-hedging risk. Treasury bond futures contracts provide greater liquidity. When interest rates decline, Treasury bond futures contracts will increase in value because these contracts track cash market Treasury bonds. These bonds have set maturity dates. Therefore, when interest rates decline, these securities will increase in value much more than a MBS with the same stated maturity (positive convexity). However, the potential for value changes in the MBS will depend on the duration of the MBS, which will vary based upon the prepayment experience of the underlying mortgages (increased prepayments yield a shorter duration).

Because the price of the MBS exceeds the par value, price appreciation is limited (due to negative convexity). This occurs because a

premium MBS results when the coupon rate exceeds the comparable interest rate for current mortgages. If the interest rate on the mortgages underlying the MBS significantly exceeds the prevailing mortgage interest rate, the probability of refinance increases. This causes the duration of the MBS to decrease faster than the duration of the Treasury bond that underlies the futures contract. If interest rates decrease, the losses from the futures positions could significantly exceed the appreciation on the MBS.

You should closely review any hedging strategy that uses Treasury futures matched against MBSs. You should also scrutinize the methods used to determine the number of futures contracts and the monitoring techniques used by management.

- Savings associations engaged in fixed-rate mortgage lending activity may attempt to protect the value of the loan pipeline by hedging. The savings association must estimate the amount of loans expected to close and quantify the risk. They may use futures contracts.
- Some savings associations attempt to synthetically extend the terms of their short-term liabilities by matching futures contracts based on short-term instruments against them. They normally use Eurodollar and Treasury bill futures contracts (par value of \$1 million) based on 90-day instruments. In this strategy, one determines the number of contracts by comparing the maturity of the hedged liability with the maturity of the instrument underlying the futures contract used. If the maturity of the liabilities and the instruments underlying the futures contract are equal (for example, both 90 days), the savings association uses a one-to-one hedge ratio. That is, for each \$1 million of liabilities hedged, there is one futures contract. If the association hedges liabilities with a maturity of six months, there are two 90-day futures contracts for each \$1 million of hedged liabilities. There is a high correlation between the savings association's method for setting the interest rates on its liabilities compared with the money market interest rate that

determines the yield on the instruments that drive the futures contracts used.

Contract Placement of Futures

Once the savings association determines the number of contracts, the savings association must select the maturity date of the futures contract. If the savings association decides to place the hedge position in futures contracts that mature at approximately the same time that the liabilities reprice/roll over, this produces a stripped hedge. If the savings association decides to concentrate all or most of the contracts in the futures contract with the most recent contract maturity, this produces a stacked hedge.

To illustrate the structure of a stripped versus a stacked hedge, assume that on June 15, 2001, a savings association decides to hedge for one year \$10 million of 90-day certificates of deposit (CDs) that will next reprice/roll over on September 1, 2001. To establish a stripped hedge, the savings association sells ten September 2001, ten December 2001, ten March 2002, and ten June 2002 futures contracts. At each contract maturity date, ten contracts will close. To establish a stacked hedge, the savings association does not place the contracts evenly by contract month over the hedge period. Instead, the savings association places all forty contracts in the nearby September 2001 contracts. When the CDs roll over in September, the association closes out ten of the futures contracts, but rolls forward thirty into December 2001 contracts. Similarly, in December 2001, an additional ten contracts close and the remaining twenty roll into March 2002 contracts. The last ten contracts close in June 2002.

Stacking contracts, as opposed to selling a strip of contracts covering the hedge period, involve decisions pertaining to the yield curve and contract liquidity. A hedge manager may establish a hedge position in a nearby contract because these contracts are normally more liquid than the more distant contracts. The hedge manager may stack the hedge position if he anticipates that the yield curve will steepen, as these contracts should provide a greater future gain relative to the nearby contracts. The manager may stack the hedge position in the nearby contracts, if he anticipates that the yield curve will flatten or invert. When re-

viewing stack hedges, it is important to determine that the motivation for the hedge transactions is to reduce the risk of the hedged item and to achieve a high level of correlation, and not to speculate on yield curve fluctuation.

Margin Requirements on Futures Contracts

The savings association must post the initial margin when they establish a futures position. This can be cash, pledged government securities, or irrevocable standby letters of credit. Initial margin requirements for Treasury bonds, Treasury bills, Eurodollars, and futures contracts are normally less than two percent of the contract par value. This margin serves as a good faith deposit, guaranteeing performance.

The value of the futures contract is marked-to-market-daily, and all changes in value settle daily in cash. The daily dollar value that changes hands is the variation margin. If the futures positions have losses, the savings association must post additional margin. The savings association may also withdraw funds equal to the unrealized gains from the margin account.

A savings association must have sufficient funds to cover any calls for variation margin. If the savings association has a large open short futures position, there is the potential for large unrealized losses if interest rates decline. You should consider the opportunity cost of variation margin deposits when evaluating the effectiveness of the hedging program.

Options

The writer (or seller) of an option sells this contract to a buyer in exchange for a sum of money called the option premium, or the option price. The holder can exercise an American option at any time during the life of the contract. A holder can only exercise a European option on the expiration date. Option contracts trade on exchanges and in the OTC (over-the-counter) markets.

For exchange-traded options, the exchange establishes standardized terms. Conversely, the terms for OTC options (for example, standby commitments) will vary significantly depending on the

participants of the agreement. Usually, exchange-traded options will have more liquidity than OTC options once market participants have accepted the contract. However, exchange-traded options track only a limited number of cash market instruments.

Characteristics of Options

A savings association can purchase (long position) or sell (short position) an option. Options differ from futures in that the holder of a option has the right to purchase or sell versus the obligation to purchase or sell with futures. In return for the right to buy or sell securities, put and call option buyers pay a negotiated premium to put and call option sellers. The seller of the option must perform if the holder exercises the option. Options can provide more flexibility than futures because the savings association can establish a wide variety of positions.

Mathematical models that represent the fair value of options use variables such as the relationship between the market and strike price, the term remaining until option expiration, marketplace volatility, and short-term interest rates. These models are based on the concept that the option premium has two components: an intrinsic or in-the-money value and time value. Intrinsic value is the amount by which the current market price of the underlying security is above the strike price for calls and below the strike price for puts. Time value is the amount by which the premium exceeds the intrinsic value.

Because option buyers have no obligation to perform after paying the premium, there is no additional margin required. Option writers undertake a firm commitment to assume a long or short position in the market at the strike price if they exercise the option. Because the seller/writer must perform, a margin deposit is required when a position is opened.

Sellers can structure OTC option transactions to meet the specific requirements of the purchaser, thereby providing more flexibility than exchange-traded options. The trade-off is that OTC options are not standardized and usually must be offset by the original counterparty, thereby limiting their

liquidity. OTC transactions most commonly involve options on MBSs.

The buyer of an option holds a long position, while the seller (writer) holds a short position. When the writer of the option owns the underlying asset, the option position is covered. When the writer does not own the underlying asset, the writer's position is naked. An option is in the money, if exercising the option produces a gain, while an option is out of the money if exercising the option does not produce a gain.

The following five factors influence the value of an option:

- Strike price.
- Current price of the underlying instrument.
- Time to expiration of the contract.
- Expected volatility of yields (or prices) over the remaining life of the option.
- Short-term risk-free interest rate over the remaining life of the option.

Hedge Ratios for Options

As with other hedging instruments, some savings associations use the par value approach, thereby matching the contract par value of the options with the hedged item. This method of determining a hedge ratio can be flawed. However, regardless of the approach, if the savings association uses long puts or calls, the maximum losses are the amount of the option premium. Therefore, the savings association knows the potential losses from basis risk.

Some savings associations use the delta of an option to determine the necessary number of contracts to use in hedging. Option valuation models generate the delta of an option. It represents the expected change in the option premium for a given change in the price of the underlying instrument. For example, a delta of 0.5 indicates that if the price of the underlying instrument changed by one dollar, the option premium would change by only 50 cents. A savings association using the delta would use the reciprocal of the

delta to determine the number of options contracts. In this example, 1.0 divided by 0.5 would equal two options contracts.

Savings associations should be careful when relying on this measure to determine the number of option contracts. The delta changes frequently, resulting in a continually changing hedge ratio. If the option is out-of-the-money [exercise price is lower (higher) than market price for puts (calls)], this could result in a significant number of option contracts. For example, if the delta were 0.1, the option premium would change 10 cents for each dollar change in the price of the underlying instrument. If a savings association used this strategy to offset the price sensitivity of the instrument underlying the option, they would use a ratio of 10 option contracts for each dollar of matched items. However, the savings association may not hold in portfolio the security that underlies the option. If the savings association matched the option position against an asset or liability that differs from the instrument underlying the option, the delta will not be as accurate.

Basic Strategies using Options

Numerous strategies use options, including complex combinations of option positions and combinations of options and futures positions. The following subsections describe these strategies.

Caps, Floors, and Collars

Customized interest rate options that savings associations use to manage interest rate risk include interest rate caps, floors, and collars. A cap is a contract that provides a buyer with protection against a rise in interest rates above some specified rate. The contract specifies an underlying interest rate index. The most common index is LIBOR. The buyer pays a premium for the option. The contract will specify the notional amount of the contract, the maturity, the settlement frequency, the interest rate index, and the level of protection (for example, the strike rate of the cap). A strike price is the price one can buy, sell, or settle the underlying instrument upon exercise of the option contract.

A savings association can use a cap to set synthetically a maximum rate, or cap, on floating-rate borrowings. If rates rise above the cap rate, the savings association will receive a payment that will offset the increase in interest expense on the floating-rate borrowings above the cap rate. Thus, a savings association can use a cap to fix the maximum rate that it would pay out on a floating-rate obligation, while allowing the savings association to benefit from a decline in rates. (A savings association can also sell a cap to generate income through receipt of a premium. You can consider the sale of caps inappropriate if it exposes the savings association to an excessive amount of interest rate risk.)

A floor is an option contract that provides the buyer with protection against declining interest rates.

A commercial bank with a relatively large portfolio of floating-rate loans might, for example, buy a floor to protect its net interest earnings against a decline in rates. For a premium, the buyer of a floor receives the difference between the strike rate (floor) and the actual rate on the index if the index falls below the floor. No payments exchange hands if the strike rate on a floor is greater than the current index rate. The seller of a floor receives a premium. You can view a floor as a series of call options.

A collar is a combination of the purchase of a cap at one rate and the sale of a floor at another rate. The cap and floor rates usually ensure that the cost of the cap equals the premium on the floor, resulting in a zero cost collar. For a savings association exposed to rising rates, a collar provides protection if interest rates increase above the strike rate on the cap. But, in exchange for that protection, the savings association gives up the benefits of lower funding costs if rates fall below the strike rate on the floor.

Swaptions

A swaption (or swap option) is an option on a swap. It gives the buyer the right, but not the obligation, to enter into a specified swap at a future date.

Standby Agreements

A standby agreement is an OTC put option on mortgages or mortgage-backed securities. Usually mortgage bankers use these agreements to offset the risk of loans that they expect to close if interest rates increase, but are otherwise uncertain as to the closure date. A savings association pays a fee to purchase this protection.

Short standby positions (short puts) involve the receipt of a fee up front for assuming the risk of having to purchase loans at a price above market price. Short puts are usually speculative. You should view them as speculative, unless a savings association can demonstrate otherwise.

Calls

A call option gives the holder (the buyer or long position) the right to buy the underlying asset at a predetermined strike price at a specified time. The buyer of a call option benefits if the price of the underlying asset rises above the strike price by an amount sufficient to cover the option premium. If the holder does not exercise the option before expiration, the option will expire worthless. The profit potential of the long call position is substantial, while the option premium is the maximum loss possible on the option. Figure 6 shows the payoff profile of a long call position.

Figure 6
Profit on Call Option - Long Position

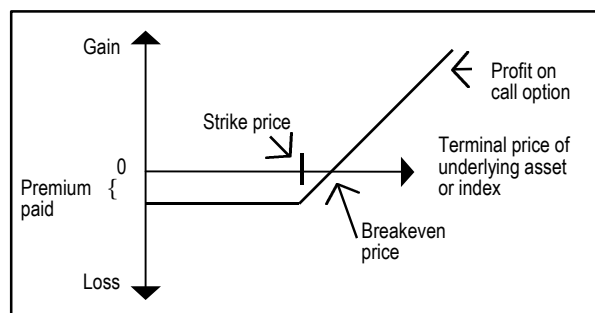


Figure 7
Profit on Call Option - Short Position

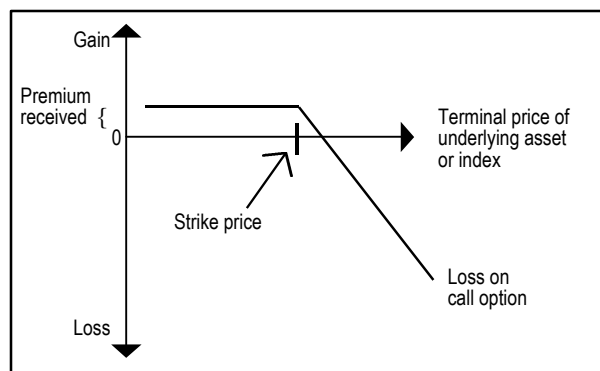


Figure 7 shows the payoff profile of the seller of a call option (the short position). Note that the payoff profile of a short call option position is the opposite of a long call position. Also, the profit potential of a short call position is only the amount of the option premium, while the loss potential is unlimited.

- **Writing Calls**

This strategy enhances the yield of securities in a portfolio. In return for a specified option premium, the savings association commits to deliver securities at a specified price within a specified time at the option of the purchaser. The savings association also receives the interest income from the securities and records any discount or premium for the securities during the term of the option. If interest rates remain stable, the time value component of the option premium will decline in value, thus benefiting the call writer. This decrease in the value of the option premium enhances the call writer's yield.

Call writing does not provide a hedge. If interest rates increase, the only protection the strategy provides is the amount of the option premium. To reduce risk in call writing, the savings association should hold in portfolio the security that underlies the call option contract. The exercise price of the call agreement should equal or exceed the book value of the securities in portfolio. If interest rates decrease and the market value of the underlying instrument exceeds the commitment price, the

option is exercised. If the savings association has the underlying security in portfolio and the exercise price of the call agreement exceeds the book value, the savings association will have only an opportunity loss. If the book value is greater than the exercise price and the securities are called away, the savings association must recognize the losses. Pursuant to SFAS 115, the savings association must classify the securities matched with short calls as either available for sale or trading.

An uncovered, or naked, short call option position can entail significant risk. This strategy involves selling call options matched against a security in portfolio that is not deliverable into the call option. One high-risk strategy is to short calls on Treasury bond futures and match this position against fixed-rate mortgages. If interest rates decline, the losses from the call positions driven by Treasury bond futures contracts can greatly exceed any benefit from the matched asset. The risks of matching Treasury bond futures against MBSs are discussed in the futures section.

- **Purchasing Calls**

For most savings associations with long-term assets and short-term liabilities, OTS does not consider the purchase of call options to be a hedge. The call provides the right to purchase the underlying securities at a specified price within a set time. When interest rates increase, call values decline, thereby providing no protection against rising interest rates.

Although not considered a hedge, some savings associations buy call options as a proxy for an investment in long-term assets. Instead of buying long-term securities, the savings association purchases call options with a portion of the funds and invests the remainder in short-term assets. If interest rates increase, the return from this strategy will be the interest income from the short-term investment reduced by the cost of the calls. This eliminates the unrealized losses that would have occurred on long-term securities. If interest rates decrease, the return will equal the interest income from the short-term investment plus the gain from the call options. For strategies of this type, the

savings association should establish reasonable limits on the amount of the premium invested.

Other strategies involving long calls include buying call options to offset the losses that can result from mortgage loan pipeline fallout, prepayment risk from a mortgage portfolio, or prepayment risk from a servicing portfolio. Some savings associations that have structured their balance sheets with longer-term liabilities and shorter-term assets may also use long calls to reduce the risk of decreasing interest rates.

You should consider any strategy involving long calls in conjunction with the regulatory capital position and the overall asset liability structure of the savings association. The savings association should have sufficient capital after providing for the write-off of the entire dollar amount of the option premium.

Puts

A put option gives the holder (the buyer, or long position) the right to sell a designated asset (or instrument) to the option writer at a specified price at a specified time. The buyer of a put option benefits if the price of the underlying asset or investment declines by an amount sufficient to cover the option premium. Figure 8 shows the payoff profile of a long put position.

Figure 8
Profit on Put Option - Long Position

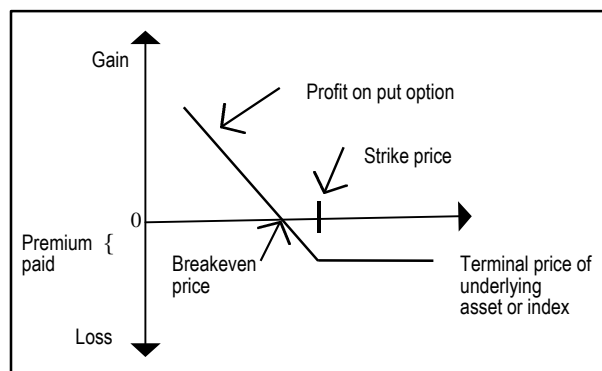


Figure 9
Profit on Put Option - Short Position

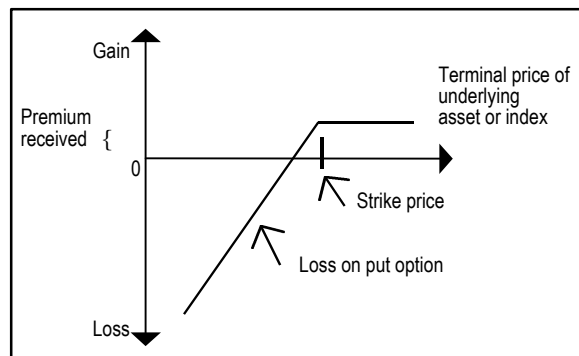


Figure 9 shows the payoff profile of a short put option. Like a short call, the profit potential on a short put is only the premium received for writing the option. However, while the downside potential is substantial, unlike a short call, it is limited.

- **Short Puts**

For most savings associations, OTS considers short put positions to be speculative transactions. In this strategy, the savings association receives a fee. In return, the savings association must buy the underlying security within the specified time at the strike price should the holder exercise the put option. The savings association expects interest rates to decline or remain stable. The maximum gain is the option premium received. The risk is equivalent to the amount by which the underlying instrument could potentially decrease in value during the term of the option if interest rates increase.

The regulations also require that the savings association record these positions at their immediate exercise value. If interest rates increase and the value of the instrument underlying the option decreases below the exercise price of the option, the savings association must record the difference as a loss through operations. The savings association must periodically adjust losses while the short put positions remain outstanding.

Combination Strategies using Options

Certain strategies involve the simultaneous purchase and sale of various options positions with different exercise prices and/or different settlement dates. For example, a savings association could purchase both a put and a call. This strategy attempts to profit from interest rate volatility. Other examples could involve the savings association simultaneously buying put or call options with different exercise prices. You must closely review any activity of this type to assess the rationale for the transactions, the risk and gains or losses.

Mortgage-Derivative Products

Some savings associations attempt to establish an economic hedge using the following instruments as hedging vehicles:

- Mortgage derivative securities such as interest only (IO) and principal only (PO) stripped mortgage-backed securities.
- Residuals and principals of real estate mortgage investment conduits (REMICs).
- Collateralized mortgage obligations (CMOs).

As hedging transactions, management should maintain reports tracking the market value of the derivative instruments and reconcile the gains and losses to the changes in the value of the hedged balance sheet items. For example, if a savings association bought \$100 million in premium IOs to hedge the market value of \$300 million of MBSs the savings association should compare the gains (losses) on the IOs with the losses (gains) on the MBSs to determine the net gain or loss from the transaction.

You should evaluate the appropriateness of using mortgage derivative products in the context of a savings association's total portfolio. In general, savings associations should limit the use of derivatives to transactions that lower or do not increase their overall exposure to interest rate risk.

Savings associations may use mortgage derivatives as an economic hedge; however, OTS considers them to be cash market instruments that

do not qualify as a hedge for accounting purposes. The hedging instrument (for example, IO) may require adjustment from time to time to reflect changes in prepayments and differences in convexity. Management should consult with its independent auditor to assure compliance with GAAP.

In addition to SFAS 133, Emerging Issues Task Force (EITF) Bulletin 89-4 provides guidance on the GAAP treatment for CMO residuals and IOs.

REFERENCES

Code of Federal Regulations (12 CFR)

Part 562	Regulatory Reporting Standards
§ 563.170	Examinations and audits
§ 563.172	Financial Derivatives
§ 563.176	Interest Rate Risk Management Procedures

Financial Accounting Standards Board, Statement of Financial Accounting Standards (SFAS)

SFAS No. 52	Foreign Currency Translation (amended and certain paragraphs superseded by No. 133 as amended)
SFAS No. 80	Accounting for Futures Contracts (superseded)
SFAS No. 105	Disclosure of Information about Financial Instruments with Off-Balance Sheet Risk and Financial Instruments with Concentrations of Credit Risk (superseded)
SFAS No. 107	Disclosures about Fair Value of Financial Instruments (as amended by No. 133)
SFAS No. 115	Accounting for Certain Investments in Debt and Equity Securities (as amended by No. 133)

SFAS No. 119 Disclosure about Financial Instruments and Fair Value of Financial Instruments (superseded)

SFAS No. 133 Accounting for Derivative Instruments and Hedging Activities (supersedes SFAS Nos. 52, 80, 105, and 119)

SFAS No. 137 Accounting for Derivative Instruments and Hedging Activities – Deferral of the Effective Date of FASB Statement No. 133 (amends SFAS No. 133 with regard to effective date)

SFAS No. 138 Accounting for Certain Derivative Instruments and Certain Hedging Activities (amends certain paragraphs of No. 133)

Emerging Issues Task Force (EITF)

No. 89-4 Accounting for a Purchased Investment in a Collateralized Mortgage Obligation Instrument or in a Mortgage-Backed Interest Only Certificate

FFIEC

Supervisory Policy Statement on Investment Securities and End-User Derivative Activities – 63 FR 20191 (April 23, 1998)

Joint Release: Interim Regulatory Reporting and Capital Guidance on SFAS 133, Accounting for Derivative Instruments and Hedging Activities (December 29, 1998)

Office of Thrift Supervision Bulletins

TB 13a Management of Interest Rate Risk, Investment Securities, and Derivative Activities

TB 13a-2 Structured Advances